

REMARKS

Claims 1-20 are currently pending in this application. Claims 6 and 12 have been cancelled. Claims 1, 7-8, and 11 have been amended for clarification of the claimed invention. No new matter has been added by this amendment. The amended claims set is provided herewith.

§112 Rejections

Claims 1-9, 11, 14-16, 19 and 20 have been rejected as being indefinite under 35 U.S.C. 112, ¶2. Claims 1 and 11 have been amended to clarify that a short chain beta glucan, for purposes of the claimed invention, is defined as beta glucan having a molecular weight of less than about 5000 Da. Support for this amendment can be found, for example, at paragraph 31 on page 8. Claim 1 has also been amended to recite that the grain is admixed into the first food product or food product intermediate, thereby creating a second food product or food intermediate.

With these amendments, Applicants assert that this rejection has been overcome; therefore withdrawal of this rejection is respectfully requested.

§102 Rejections

Claims 1-3 and 6-17 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,871,571 to Jensen.

Claims 1-3, 11, 14-16 and 19 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. U.S. Patent No. 3,880,742 to James.

Claims 1-3, 9, 11 and 14-16 has been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,458,893 to Smith.

Applicants assert that the claimed invention is not anticipated by any of the three references cited above. As now claimed, Applicants found that by admixing beta-glucans having a molecular weight of less than 5000 Da with food improves the acid binding functionality of the food, thereby making the resultant food more effective as a cholesterol reducing edible material. Applicants' identification of the short chain beta-glucan (a specific type of beta glucan) effected the discovery that food can be with an improved bile acid-binding capability. It was found that by minimizing the self-interaction among the chain segments of beta-glucan, more bile acid binding capacity could be achieved. (See for example, the discussion on page

15 of the specification.) Beta glucans with strong self-interaction among segments resulted in low solubility.

Jensen relates to the use of glucose oligomers as bulking agents to provide low calorie foods. The oligomers are used as substitutions for sucrose and other sugars. Jensen teaches that the bulking agent is "produced from beta-glucan as a starting material."

In contrast to the teachings of Jensen, the presently claimed invention reflects the Applicants' recognition of short chain beta glucan's healthful benefit beyond its capacity as a bulking agent. Jensen failed to recognize and therefore teach how food products or food product intermediates can be modified with short-chain beta-glucans to take advantage and effect beta-glucan's bile acid binding capabilities, as Applicants claim.

James teaches the preparation of a beta-1,4/beta-1/3 glucanase enzyme. This reference also fails to disclose each and every element of the present claims, as nowhere in the reference is it taught to use a short-chain beta-glucan (molecular weight of less than 5000 Da) for preparation of a food product or food product intermediate to achieve beneficial and improved bile-acid binding function. James focuses on teaching a method of preparing an enzyme, not on the preparation of a food product (or intermediate) that has improved bile acid binding. The Examiner relies on Example 5 of James et al., where it discloses that the enzyme content of a feed led to "significant weight gain of chickens . . . and increases the metabolisable energy of the diet." James, however, does not disclose or identify the use of a short chain beta-glucan in order to minimize typical beta-glucan's self-interaction of segments. Thus, James' failure to recognize that a different type of beta-glucan is advantageous for improving the products' binding efficiency deems James a non-anticipating reference.

Smith relates to a process of using beta-glucanase to treat water-soluble fiber. As with the other two references, Smith falls short of teaching each and every element of Applicants' claimed invention. Clearly unlike Smith, the presently claimed invention is applicable to both soluble and insoluble dietary fibers. At column 3, lines 2-5, Smith notes that the water soluble dietary fiber is substantially free of water-insoluble fiber. This is likely due to Smiths' lack of recognition that the self-interaction (or aggregations) of beta glucan segments is a competing factor for beta glucan's binding capacity, and therefore Smith intentionally formulated the composition to be free of water-insoluble fiber. The requirement of Smith, that the

composition be free of water-insoluble fiber, however, is not a limitation to the present process, since Applicants were able to identify and carefully select short chain beta-glucans that have less aggregation tendencies. Smith neither teaches nor did it recognize that short chain beta-glucan have greater suitability and therefore could be useful and compatible with all dietary fibers. Applicants respectfully assert that this reference does not anticipate the claimed invention.

Accordingly, withdrawal of these rejection is respectfully requested.

§ 103 Rejection

Claims 1- 20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over individual references Jensen et al., James et al., and Smith.

Each of the references have been discussed above. Applicants assert that a skilled artisan, relying on any of the three cited references, would not have found the instantly claimed invention obvious. There is no suggestion in any of the references that a short chain beta-glucan would be beneficial in improving the bile acid binding capabilities of a food.

Furthermore, the Examiner states at page 10 of the Office Action, that "Absent some demonstration of an unexpected result, the inactivation step recited in claim 18 must be considered obvious." Applicants disagree. The requirements for non-obviousness need not necessarily include unexpected result. Applicants agree that a showing of an unexpected result would be beneficial evidence of non-obviousness; however, there are other factors that would lead to a conclusive non-obviousness characterization. Applicants' claimed invention utilizes a specific type of beta-glucan – short-chained, with a molecular weight of less than 5,000 Da. It was their discovery that decreasing the segment interaction of beta-glucan increases the bile acid binding capability of a food product, therefore beta-glucans of lower molecular weight are suitable used. Based on the teachings of the references, a skilled artisan would have been led to use the longer chain beta-glucan and would have had no motivation to use shorter chain, lower molecular weight components to achieve an improved binding efficiency.

Based on the above reasons, Applicants respectfully request that this rejection be withdrawn.

Applicants respectfully request reconsideration and allowance of the claims as all rejections have been overcome. Early notice of allowability is kindly

requested. Please contact the undersigned if it will assist in expediting prosecution of these claims.

Please apply any further charges or refunds to Deposit Account No. 07-0900 and provide notification of such transaction(s) to the address below.

Respectfully submitted,



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